

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application. Material inserted is indicated by underlining and material deleted is indicated by ~~strikeout~~.

Listing of Claims:

1. (Currently Amended) A microscope having at least one illumination beam path (~~2~~; ~~2~~, ~~2'~~) and at least one detection beam path (~~5~~), characterized in that

each illumination beam path (~~2~~; ~~2~~, ~~2'~~) is provided with a focusing arrangement

(~~3~~; ~~3~~, ~~3'~~) for producing a ~~two-dimensional~~ an object illumination region

(~~20~~) which extends in the direction of an illumination axis of the

illumination beam path (~~2~~; ~~2~~, ~~2'~~) and transversely thereto,

a detection direction (~~10~~) of the at least one detection beam path (~~5~~) is

approximately orthogonal to the ~~two-dimensional~~ object illumination

region (~~20~~), and

a mobile arrangement (~~12~~) is provided for producing a relative movement

between the ~~two-dimensional~~ object illumination region (~~20~~) and an

object (~~4~~) to be studied and the mobile arrangement has at least one

rotational axis corresponding substantially to the direction of gravity.

2. (Currently Amended) The microscope as claimed in claim 1, characterized in that

the mobile arrangement ~~(12)~~ can produce a rotational movement of the object ~~(4)~~ and/or a displacement movement of the object (4).

3. (Currently Amended) The microscope as claimed in claim 1, characterized in that the mobile arrangement ~~(12)~~ is designed to move the object (4) while the ~~two-dimensional~~ object illumination region (20) is essentially stationary.

4. (Currently Amended) The microscope as claimed in claim 1, characterized in that the mobile arrangement is designed to move the ~~two-dimensional~~ object illumination region (20) while the object (4) is essentially stationary.

5. (Currently Amended) The microscope as claimed in claim 1, characterized in that the at least one illumination beam path ~~(2; 2, 2')~~ has a cylindrical lens ~~(3; 3, 3')~~ for focusing the illumination light.

6. (Currently Amended) The microscope as claimed in claim 5, characterized in that the cylindrical lens ~~(3; 3, 3')~~ can be rotated about the illumination axis and/or displaced in the direction of the illumination axis and/or the cylinder axis, and/or can be tilted via the cylinder axis with respect to the illumination axis.

7. (Currently Amended) The microscope as claimed in claim 6, characterized in that the movement of the cylindrical lens ~~(3; 3, 3')~~ is a high-frequency movement.

8. (Previously Presented) The microscope as claimed in claim 1, characterized in that

scattered light or fluorescent light of one or more wavelengths is used.

9. (Currently Amended) The microscope as claimed in claim 1, characterized in that the illumination light beam is produced by a light source, which (1; 1', 1'') is a lamp or a laser, which provides light of one or more wavelengths.

10. (Currently Amended) The microscope as claimed in claim 1, characterized in that the object (4) is to be held by a holder (12) in a sample chamber (13), in which it can be ~~rotated about an axis (14) corresponding essentially to the gravitational direction and can be moved along at least one~~ direction.

11. (Currently Amended) The microscope as claimed in claim 1, characterized in that at least two illumination beam paths (2, 2') with essentially opposite illumination directions are provided for producing at least locally overlapping ~~two-dimensional~~ object illumination regions (20).

12. (Currently Amended) The microscope as claimed in claim 11, characterized in that

the illumination light of the two illumination beam paths (2, 2') interferes at least locally in the direction of the illumination axis in the region of the ~~two-dimensional~~ object illumination region (20).

13. (Currently Amended) The microscope as claimed in claim 12, characterized in that

the illumination light of the two illumination beam paths (2, 2') has a constant, adjustable phase.

14. (Currently Amended) The microscope as claimed in claim 1, characterized in that

the at least one detection beam path (5) has a detector, and in that the detector can be moved laterally with respect to the detection direction of the at least one detection beam path (5).

15. (Currently Amended) The microscope as claimed in claim 1, characterized in that

the at least one detection beam path (5; 5') can be adapted so that the detection direction is approximately orthogonal to the ~~two-dimensional~~ object illumination region (20) when the object illumination region (20) is shifted.

16. (Currently Amended) A microscope having at least one illumination beam path (2) and at least one detection beam path (5), characterized in that

each illumination beam path (2) is provided with a focusing arrangement (3) for producing a linear object illumination region (20') which extends in the direction of an illumination axis of the illumination beam path (2), a detection direction (10) of the at least one detection beam path (5) is approximately orthogonal to the linear object illumination region (20'), and at least one mobile arrangement (~~24, 26, 28~~) is provided for producing a relative movement between the linear object illumination region (20') and an object (4) to be studied.

17. (Currently Amended) The microscope as claimed in claim 16, characterized in that

the at least one mobile arrangement (~~24, 26, 28~~) is designed to produce a relative movement between the object (4) and the linear object illumination region (20') essentially orthogonally to the illumination axis and the detection direction (10).

18. (Currently Amended) The microscope as claimed in claim 17, characterized in that

the at least one mobile arrangement is designed to move the object (4) in order to produce a relative movement.

19. (Currently Amended) The microscope as claimed in claim 17, characterized in that

the at least one mobile arrangement (~~24, 26, 28~~) is designed to move the at least one illumination beam path (~~2~~) at least in the linear object illumination region (~~20'~~) provided by it, in order to produce the relative movement.

20. (Currently Amended) The microscope as claimed in claim 19, characterized in that

the at least one mobile arrangement (~~24, 26, 28~~) is designed to move the at least one detection beam path (~~5~~) in accordance with the movement of the at least one illumination beam path (~~2~~), at least in its region near the object.

21. (Currently Amended) The microscope as claimed in claim 16, characterized in that

the at least one detection beam path (~~5~~) has a detector (~~8~~) with a multiplicity of detector pixels.

22. (Currently Amended) The microscope as claimed in claim 21, characterized in that

the number and positioning of the detector pixels of the detector (~~8~~) are selected so that the at least one detection beam path (~~5~~) projects a

section of the object (4), illuminated by the at least one illumination beam path (2) in the object illumination region (20'), essentially fully onto the detector (8).

23. (Currently Amended) The microscope as claimed in claim 16, characterized in that

the at least one mobile arrangement is designed to move the object to be studied essentially in the direction of the detection direction (40) of the at least one detection beam path (5).

24. (Canceled)

25. (New) A microscope having at least one illumination beam path and at least one detection beam path, characterized in that

each illumination beam path is provided with a focusing arrangement for producing an object illumination region which extends in the direction of an illumination axis of the illumination beam path and transversely thereto,
a detection direction of the at least one detection beam path is approximately orthogonal to the object illumination region,
a mobile arrangement is provided for producing a relative movement between the object illumination region and an object to be studied, and

the object is mounted on a holder, the holder being movable within a sample chamber.

26. (New) The microscope as claimed in claim 25, characterized in that the mobile arrangement can produce a rotational movement of the object and/or a displacement movement of the object.

27. (New) The microscope as claimed in claim 25, characterized in that the mobile arrangement is designed to move the object while the object illumination region is essentially stationary.

28. (New) The microscope as claimed in claim 25, characterized in that the mobile arrangement is designed to move the object illumination region while the object is essentially stationary.

29. (New) The microscope as claimed in claim 25, characterized in that the at least one illumination beam path has a cylindrical lens for focusing the illumination light.

30. (New) The microscope as claimed in claim 29, characterized in that the cylindrical lens can be rotated about the illumination axis and/or displaced in the direction of the illumination axis and/or the cylinder axis, and/or can be tilted via the cylinder axis with respect to the illumination axis.

31. (New) The microscope as claimed in claim 30, characterized in that
the movement of the cylindrical lens is a high-frequency movement.
32. (New) The microscope as claimed in claim 25, characterized in that
scattered light or fluorescent light of one or more wavelengths is used.
33. (New) The microscope as claimed in claim 25, characterized in that
the illumination light beam is produced by a light source, which is a lamp or a
laser, which provides light of one or more wavelengths.
34. (New) The microscope as claimed in claim 25, wherein
the holder is rotatable about an axis corresponding substantially to the
direction of gravity.
35. (New) The microscope as claimed in claim 25, characterized in that
at least two illumination beam paths with essentially opposite illumination
directions are provided for producing at least locally overlapping object
illumination regions.
36. (New) The microscope as claimed in claim 35, characterized in that

the illumination light of the two illumination beam paths interferes at least locally in the direction of the illumination axis in the region of the object illumination region.

37. (New) The microscope as claimed in claim 36, characterized in that the illumination light of the two illumination beam paths has a constant, adjustable phase.

38. (New) The microscope as claimed in claim 25, characterized in that the at least one detection beam path has a detector, and in that the detector can be moved laterally with respect to the detection direction of the at least one detection beam path.

39. (New) The microscope as claimed in claim 25, characterized in that the at least one detection beam path can be adapted so that the detection direction is approximately orthogonal to the object illumination region when the object illumination region is shifted.

40. (New) The microscope as claimed in claim 25, wherein the object illumination region is substantially planar-shaped.

41. (New) The microscope as claimed in claim 25, wherein the object illumination region is substantially linearly-shaped.

42. (New) The microscope as claimed in claim 1, wherein
the object illumination region is substantially planar-shaped.
43. (New) The microscope as claimed in claim 1, wherein
the object illumination region is substantially linearly-shaped.